

Remarks

Claims 1-8 are pending in the application. Claim 8 has been withdrawn from consideration. Claims 1-7 have been examined.

Minor changes of an editorial nature have been made to claims 1, 4, 6 and 7 for clarity. Claims 1 and 2 have been amended to move a feature from claim 2 into claim 1, namely, a pair of spaced metal films adapted to selectively separate hydrogen from the fuel.

A substitute specification and abstract are submitted herewith, to improve the translation. No new matter is added.

The abstract has been objected to. The new abstract overcomes the objection.

The abstract, specification, and claim 1 have been objected to because the word "raffinate" is allegedly improperly used. The rejection alleges that the various occurrences of "raffinate" should be changed to *reformate*. Applicants respectfully disagree.

The term "reformate" means the gas including pure hydrogen gas acquired by a reforming procedure before entering into a hydrogen gas separation cell. The term "raffinate" means the gas including pure hydrogen gas and other gases, that is, gases which are not removed by passage through the gas separation cell. Thus, it is respectfully submitted that the term "raffinate" is correct in the context of the present invention.

The changes in reference numerals recommended by Examiner have been made at page 11, line 27 and page 15, line 21.

Examiner requested insertion of the article "a" before the word "diffusion" in claims 5 and 7. However, the claims as filed and presently pending already include the article "a" in the indicated provision.

Claims 1-7 stand rejected as allegedly obvious over Edlund *et al.* U.S. Pat. 5,997,594 ("Edlund") in view of JP 5-155602.

Claim 1 defines a miniature fuel reformer comprising a plurality of hydrogen gas separation cells. Edlund teaches a single gas separation cell, not a device characterized by plural

cells, as in the present invention. Claim 1 is further distinguished over Edlund in that the plural hydrogen gas separations cells of the claimed apparatus comprise a pair of spaced metal films adapted to selectively separate hydrogen from fuel. The corresponding feature of Edlund is a membrane tube (54). Edlund does not describe a device including a hydrogen gas separation cell which includes a pair of spaced metal films for selectively separating hydrogen from fuel.

The invention as claimed in claim 2 is further distinguished over Edlund in that the hydrogen gas separations cells of the claimed apparatus include at least one radial hole communicating with a hydrogen passage. There is no corresponding radial hole in the device of Edlund.

The above deficiencies are not remedied by JP 5-155602. JP 5-155602 does not disclose plural hydrogen gas separations cells, hydrogen gas separation cells composed of spaced metal films, or hydrogen gas separation cells containing a radial hole communicating with a hydrogen passage. The combination of Edlund and JP 5-155602 fails to result in the claimed invention. Thus, the invention would not have been obvious from a combination of these references.

Reconsideration and withdrawal of the Section 103 rejection over Edlund in view of JP 5-155602 is respectfully requested.

Claims 1 and 3 stand rejected as allegedly obvious over Shirasaki *et al.* U.S. Pat. 5,639,431 ("Shirasaki") in view of JP 5-155602. Like the other references, Shirasaki fails to disclose hydrogen gas separations cells composed of spaced metal films. The corresponding feature of Shirasaki is a hydrogen-permeable tube (32). Shirasaki does not describe a device including a plurality of hydrogen gas separation cells, which cells comprise a pair of spaced metal films for selectively separating hydrogen from fuel. Since JP 5-155602 fails to disclose this feature, the asserted combination of references does not result in the claimed invention. Thus, the invention would not have been obvious from a combination.

Reconsideration and withdrawal of the Section 103 rejection over Shirasaki in view of JP 5-155602 is respectfully requested.

All claims remaining in the application are believed in condition for allowance. An early action toward that end is earnestly solicited.

Respectfully submitted,

JAESUNG HAN, et al.

BY: 

DANIEL A. MONACO
Registration No. 30,480
Drinker, Biddle & Reath LLP
One Logan Square
18th and Cherry Streets
Philadelphia, PA 19103-6996
Tel: 215-988-3309
Fax: 215-988-2757
Attorney for Applicants



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FIG 1
(PRIOR ART) ← Added

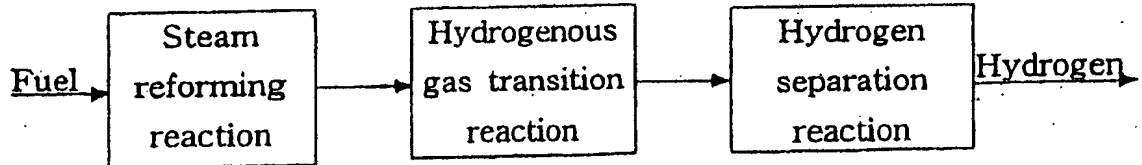
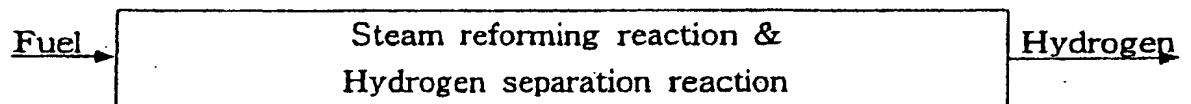


FIG 2



Amendments to the Drawings:

The attached sheet of drawings includes changes to Fig. 1. This sheet, which includes changes to Fig. 1, replaces the original sheet including Fig. 1-2. In Fig. 1, the legend "PRIOR ART" has been added.

Attachment: Replacement Sheet
Annotated Sheet Showing Changes